

**CALIFORNIA OCCUPATIONAL HEALTH AND SAFETY SURVEILLANCE
OCCUPATIONAL HEALTH INDICATORS
ANNUAL REPORT**

July 1, 2011 - June 30, 2012

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The overall aims of the Occupational Health Indicators Component are to:

- Collect and analyze surveillance data for 20 Occupational Health Indicators (OHIs) and an Employment Demographics Profile annually;
- Identify and respond to emerging occupational health issues;
- Collaborate with in-state partners to obtain input to guide our program, gain support to further program goals, and have impact on public health and regulatory policies;
- Collaborate with other states, the Council of State and Territorial Epidemiologists (CSTE), and NIOSH on nationwide activities to reduce work-related injury and illness;
- Disseminate our surveillance data, investigation findings, public health recommendations, and educational materials through a variety of means; and
- Regularly evaluate the accomplishments and impact of our occupational health program, and develop recommendations for improving effectiveness.

MAJOR OUTPUTS

Data, Electronic and Web-based Communications See www.cdph.ca.gov/programs/ohb

1. Completed submission of 2008 and all available 2009 data for Employment Demographics Profile and 20 OHIs.
2. Calculated new Low Back Disorder Hospitalizations indicator starting with 2007 data.
3. Completed construction of a website topic page featuring all **California OHI data** from the year 2000 forward, in comparison to national data where available.
4. Created and disseminated to over 5,000 recipients eight issues of our electronic program newsletter **Occupational Health Watch (e-OHW)**. The January 2012 issue "Preventing Worker Illness from Indoor Pesticide Exposure" introduced a new website topic page and fact sheets on that topic. The March 2012 issue "Preventing Tick Bites Among Outdoor Workers" was the first to arise from collaboration with a CDPH communicable disease program, the Vector-Borne Disease Section. The June 2012 issue, "California Workers' Health," announced the OHI website with data through 2008 and a new California Worker Health & Safety at a Glance fact sheet.
5. Developed a **Respiratory Protection Program Toolkit** for hospital respirator program administrators, which has been distributed to California hospitals and health care stakeholders, and widely publicized along with new website topic page, "Respiratory Protection for Health Care Workplaces" (partnership with NIOSH National Personal Protective Technology Laboratory (NPPTL)).

6. Began publicizing OHB fact sheets and other resources through the CDPH Twitter account, YouTube channel, and Facebook page. Began discussion of OHB use of blogs and other social media to disseminate video and other materials.
7. Updated the NIOSH State-Based Occupational Health Surveillance Clearinghouse (includes 501 California publications to date).
8. Cleaned and expanded our electronic database of stakeholder contacts, with particular focus on trade associations, unions, and attendees of CDPH-sponsored webinars on green cleaning products/pesticide use and schools.
9. Convened an OHB-wide one-day communications planning meeting to increase efficiency of materials dissemination, including through website postings, e-OHW, and use of social media.

Partnerships

1. Created an article about OHB digital stories project for the second annual edition of the popular publication, "Dying at Work in California," produced by the nonprofit group **WorkSafe**. The publication was released for Workers Memorial Day in April 2012, at a community event hosted by WorkSafe, and was mailed to state legislators and others.
2. Continued and expanded partnerships under which OHB staff provide mentoring to develop the future occupational health workforce (**CDC Epidemic Intelligence Service** program, **CDC Public Health Associate** program, **CSTE epidemiology fellowship** program, **University of California at San Francisco** occupational and preventive medicine fellowship program).
3. Initiated a collaboration with CDPH's **Environmental Public Health Tracking** Program to include more OHIs and other occupational health surveillance data in their data portal.
4. Initiated new partnerships with county health departments, California Department of Corrections, and Cal FIRE on educational activities for prevention of **occupational coccidioidomycosis**. Provided technical assistance in investigation of cases among inmate wildland firefighting crews.
5. Continued a partnership with **NIOSH NPPTL** on improving respiratory protection programs for health care workers by initiating a new project to adapt the California Respiratory Protection Program Toolkit into a national version, and by serving on an advisory group for a Joint Commission/NPPTL project to identify and produce a monograph on best practices in respiratory protection programs in health care.
6. Developed a data sharing agreement that will allow a **NIOSH Division of Respiratory Disease Studies** researcher (Jean Cox-Ganser) to use de-identified medical surveillance data from California flavor manufacturing workers, combined with data from NIOSH and other sources, to assess the relationship between restrictive lung disease and flavoring exposures.

Presentations and Publications

1. Das R et al. Occupational coccidioidomycosis in California: Outbreak investigation, respirator recommendations, and surveillance findings. *JOEM* 2012; 54(5):564-571.
2. Kreiss et al. Longitudinal lung function declines among California flavor manufacturing workers. *Am J Indus Med* 2012; 55:657-668.
3. CDC. Chlorine gas exposure at a metal recycling facility – California, 2010. *MMWR* July 22, 2011; 60(28):951-954.

4. Presentations at CSTE annual meeting, Omaha, NB, June 2012: Susan Payne, "Obtaining occupational information in electronic lab reports"; Stella Beckman, "Assessment of flight attendants; exposure to PBDE flame retardants".
5. Presentations on the use of respirators for protection of health care workers from aerosol transmissible diseases and OHB field studies on respiratory protection programs and practices in acute care hospitals: NIOSH NPPTL stakeholder meeting, Pittsburgh, PA, March 2012; Association of Professionals in Infection Control Sierra Chapter Educational Forum, Sacramento, CA, September 2011; UCSF Occupational/Environmental Medicine Grand Rounds, January 2012.

MAJOR OUTCOMES

Potential Outcomes

1. See above; nearly all items described above include dissemination of findings and public health prevention recommendations based on our work that, if used by others, would reduce workplace health and safety risks.
2. Completed notification to 20 flavor manufacturing companies, their medical providers, and 150 workers with lung abnormalities of findings, recommendations, and available resources (NIOSH materials on diacetyl and substitutes, improving spirometry quality; CDPH updated guidance for medical surveillance) for prevention of **flavoring-related lung disease**.
3. Developed and disseminated several new educational materials to highlight the acute toxicity of **methylene chloride-based paint strippers**, and to promote safer alternative work processes and products, following investigations of worker deaths in two different industries. CDPH sent a letter to the Consumer Product Safety Commission recommending that CPSC re-evaluate the hazard posed by these products to consumers and workers who purchase them in retail stores; also shared this information with other states. Investigated the history of regulation of these products in the U.S. and European Union. Shared relevant information with the California Department of Toxic Substances Control, which is developing new "green chemistry" regulations pertaining to consumer products that contain toxic substances.

Intermediate Outcomes

1. OHB played a prominent role in the second Cal/OSHA Advisory Committee Meeting on **revision of the Cal/OSHA general industry and construction lead standards** for better worker protection from chronic, low-level lead exposure. OHB's specific, detailed recommendations for revisions to both standards were presented by Dr. Materna and discussed by stakeholders. Cal/OSHA will be developing draft revised regulations based on OHB and Advisory Committee input.
2. Assisted the **Contractor State Licensing Board** in publishing an article in their statewide newsletter highlighting the hazards of methylene chloride-based paint strippers and our recommendations for choosing safer approaches.
3. Increased the reach of e-OHW by arranging for: 1) member distribution through trade associations such as the California **Building Owners and Managers Association** (BOMA); and 2) reposting on labor, trade association, and public health blogs, listservs and publications. Blogs include Labor's Edge, by the California Federation of Labor; listservs include the e-newsletter of the California Public Health Association-North; publications include, "The California Painting & Decorating Contractor."

4. Increased ties with BOMA for disseminating relevant fact sheets (on safer fumigation and other indoor pesticide use, green cleaning, etc.) directly to its 12,000 commercial building owner/manager members; presenting to BOMA's environmental committee in San Francisco; posting on its blog and internal e-newsletter; writing articles for its membership publications and website.

End Outcomes

It is often quite difficult to attribute a change in morbidity or mortality to specific work conducted by OHB, especially when multiple entities are carrying out various interventions aimed at the same occupational health problem. However, when multiple parties come together at one point in time to respond jointly to a newly identified issue with a comprehensive, concerted effort, it can be easier to see the overall impact.

OHB's work to investigate and prevent ***flavoring-related lung disease among workers in the California flavor manufacturing industry*** has extended over a period beginning in late 2004 when the first case of bronchiolitis obliterans was identified in a California worker, followed by a second case in 2006. This major industry-wide effort, conducted in collaboration with NIOSH and Cal/OSHA, has come to a close with the publication in 2012 of our final journal article on the longitudinal analysis of medical surveillance data and the notification of participants of findings. We believe that there is now a far greater awareness nationwide of the hazards of the butter flavor chemical diacetyl and of structurally related substitutes. Many companies have ended or limited their use of diacetyl. Our work in California stimulated many other efforts in other states and at NIOSH and Federal OSHA. Cal/OSHA visited all flavor manufacturing plants in California (identified by OHB) and ensured that they implemented comprehensive respirator programs and in many cases effective local exhaust ventilation to reduce exposure to diacetyl and other flavoring chemicals. Widespread implementation of medical surveillance programs identified more workers with flavoring-related illness, but at earlier stages of disease so that intervention could limit disease progression. California now has an occupational standard for diacetyl. We believe that our efforts did indeed contribute to reductions in workplace exposures and worker illness related to flavoring exposures.

**CALIFORNIA OCCUPATIONAL HEALTH AND SAFETY SURVEILLANCE
WORK-RELATED INJURY FATALITIES
ANNUAL REPORT**

July 1, 2011 - June 30, 2012

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The overall aims of the project are to identify, characterize, and prevent occupational fatalities in California by:

- Maintaining and enhancing case ascertainment using multiple data sources;
- Performing case-based field investigations and developing prevention strategies;
- Collaborating with local and state agencies, and a wide range of other partners;
- Disseminating results generated from project activities; and
- Evaluating surveillance activities on an ongoing basis.

MAJOR OUTPUTS

Data

1. A total of 2,287 work-related injury fatalities in Los Angeles County have been identified, coded and analyzed since 1992.
2. The overall fatality rate is 2.9 per 100,000 workers. The rate of work-related fatalities among Hispanic workers (3.8) was 58% higher than for non-Hispanic workers (2.4). Among Hispanic workers, the top 5 occupations with the highest fatality rates are roofers (43.4); taxi drivers & chauffeurs (31.9), door-to-door sales & street vendors (27.4), security guards (24.8) and construction laborers. Among non-Hispanic workers, the top 5 occupations with the highest fatality rates are counter & rental clerks (46.2); taxi drivers & chauffeurs (21.2); police officers (16.7), driver/sales workers & truck drivers (16.0) and construction laborers (14.4).

Publications, Reports, Web-based Communications

(See <http://www.cdph.ca.gov/programs/ohb-face/Pages/Publications.aspx>)

1. A total of eight on-site investigation reports were published and posted to the FACE Website:
 - 10CA011: Orchard caretaker dies when he is pulled into a wood chipper
 - 11CA001: Plumber dies when he falls from the second floor of a building after stepping on unsupported plywood formwork
 - 11CA002: Day laborer dies when he falls off a scaffold
 - 11CA003: Tree trimmer dies from electrocution when a tree branch falls onto energized power lines
 - 11CA004: Roofing supervisor dies when he falls through skylight
 - 11CA005: House painter dies when he falls through a roof opening

- 11CA006: Automotive mechanic dies from thermal burns when the gasoline he was pouring into a vehicle ignited
- 12CA002: Automotive Maintenance worker dies from exposure to methylene chloride while stripping the floor of a baptismal font in a church.
2. Two fatality alerts, *Methylene Chloride Linked to Worker Death in Tank* (January 2012), *Methylene Chloride Linked to Worker Death in Church* (April 2012) were published and posted on the website. These alerts were based on two fatality investigations involving two workers who died when they inhaled toxic amounts of Methylene Chloride (found in the paint strippers they were using).
 3. Two bilingual digital stories (short safety videos) were produced that highlight findings and prevention recommendations from a fatality investigation involving a groundsman who died when he was thrown against a wood chipper. Both videos are available on the CDPH YouTube Channel <http://youtu.be/7NKZM9IIEk> (English) and <http://youtu.be/H9nLGoSEUYw> (Spanish).
 4. A digital story (English) was produced that highlights findings and fall prevention recommendations from a fatality investigation involving a solar installer who fell from an apartment roof. The video is available on the CDPH YouTube Channel <http://youtu.be/imiFPy2DZkM> and the joint OSHA and NIOSH Fall Prevention Campaign <http://www.osha.gov/stopfalls/>.
 5. Published an article about the FACE digital stories for the 2nd annual edition of the publication "Dying at Work in California" produced by the nonprofit group WorkSafe. The publication was released for Worker's Memorial Day in April 2012, at a community event hosted by WorkSafe, and was mailed to state legislators and others.
 6. Three FACE/OHB e-mail blasts featuring FACE materials and prevention recommendations (*Preventing Wood Chipper Deaths*, *CA FACE Publishes 3 New Investigation Reports* and *Preventing Falls in the Solar Industry – A New 'Digital Story' for Workers Memorial Day*) were disseminated to 2,000 employers and 5,000 OHB stakeholders.
 7. 12,136 hard-copy English and Spanish fact sheets were disseminated to workers, employers, labor organizations, labor centers, foreign consulates, community-based organizations, trade associations, state and local agencies and health care professionals.
 8. Published a website topic page featuring all solar installation investigations, fact sheets, alerts and digital stories.
 9. FACE fact sheets, investigation reports, fatality alerts and digital stories were promoted using social media including CDPH and NIOSH FACE twitter, YouTube, and Facebook pages. A *FACE Worker Fatality Investigation YouTube Playlist* was created to feature our three digital stories.

Presentations

1. "Fatal Assault at a Forensic Psychiatry Facility in California." Primary care provider meeting, August 17, 2011.
2. "Compelling Worker Health and Safety Through Digital Storytelling." WestON Meeting, Denver, CO, September 22, 2011.
3. "FACE Fatality Investigation (Workplace Violence)." CDPH Division of Environmental and Occupational Disease Control meeting, Richmond, CA, October 4, 2011.
4. "FACE Program Update." Annual FACE meeting, Boston, MA, October 12, 2011.
5. "Wood Chipper Digital Story". Annual FACE meeting, Boston, MA, October 13, 2011.

6. "Worker Fatalities Involving Wood Chippers: The California FACE Program." American Public Health Association Annual Meeting, Washington, DC (November 1, 2011).
7. "Workplace Violence." UCSF Occupational Medicine Grand Rounds, San Francisco, CA, December 15, 2011.
8. "The California FACE Program: Solar Installer Investigation Findings." Electric Power Research Institute Occupational Health and Safety Conference, Huntington Beach, CA, February 13th, 2012.
9. "FACE Fatality Investigations: MeCl Cases." CDPH Division of Environmental and Occupational Disease Control Division Meeting, Richmond, CA, March 6, 2012.
10. "The California FACE Digital Story: *Preventing Falls in the Solar Industry*." Action Summit on Worker Safety and Health (Hilda Solis event), Los Angeles, CA, April 26, 2012.
11. "The California FACE Program." American Society of Safety Engineers Meeting, Long Beach, CA. May 9, 2012.

MAJOR OUTCOMES

Potential Outcomes (findings, results, or recommendations that could impact workplace risk if used)

1. Notified 1,200 California solar panel installation companies of investigation findings and prevention recommendations.
2. Based on a fatality investigation involving a solar installer who fell from an apartment roof, we created a digital story highlighting our findings and the importance of fall protection. This video was disseminated to solar installation and construction employers, trade associations, community-based green job training programs, community colleges. The e-mail blast announcing the video effort and prevention recommendations was reposted on labor and trade association websites and public health blogs and listservs. The video was featured as a key training tool for the joint OSHA and NIOSH *Fall Prevention Campaign* <http://www.osha.gov/stopfalls/>, and was shown to over 400 attendees at the Workers' Memorial Day event at the action Summit for Worker Safety and Health on April 26th 2012.
3. Made presentations about digital story theory and production process at multiple conferences and meetings.
4. Developed and disseminated two fatality alerts to highlight the acute toxicity of methylene chloride-based paint strippers, and to promote safer alternative work processes and products, following investigations of worker deaths in two different industries. FACE/CDPH sent a letter to Consumer Product Safety Commission recommending that CPSC re-evaluate the hazard posed by methylene chloride-based paint strippers to consumers and workers who purchase them in retail stores and also shared this information with other states. Shared relevant information with the California Department of Toxic Substances control, which is developing new "green chemistry" regulations pertaining to consumer products that contain toxic substances. We are currently completing the corresponding fatality investigations, writing a peer-reviewed publication and completing a survey of consumer sales of MeCl products (22 Bay Area hardware stores).

Intermediate Outcomes (findings and recommendations used by others)

1. Based on findings from multiple California FACE fatality investigations involving work in or around trees or wood chippers, we provided comment on the proposed Cal/OSHA Revision of General Industry Safety Orders, Division 1, Chapter 4, Subchapter 7, Article 12, Sections 3420-3428, Tree Work, Maintenance or Removal. As a result of our written comments, Cal/OSHA revised 3424 (c) (11): In requirements for brush chippers, staff has added a requirement that ropes that present entanglement hazards be prevented from entering the point of operation of the chipper. The modification is based on comments from the Occupational Health Branch of CDPH noting incidents in which workers died after being struck by or entangled in ropes (from Cal/OSHA reporter).
2. The largest national tree care industry trade association has adopted our wood chipper digital story, fact sheet, and investigation report into the *National Chipper Training Initiative* curricula. This initiative aims to train thousands of tree care professionals nationwide to adopt safer work practices.
3. We are working with the American Society for Testing and Materials (ASTM) International to help establish a new test method for human impact on commercial skylights. (ASTM WK17797). We are contributing findings from four CA FACE fatality investigations to determine the weight of worker to protect, distance of fall, material/equipment selection, testing protocol, weathering effects, and labeling. FACE staff contributes to monthly committee meetings and work on the standard is ongoing.
4. Assisted the Contractor State Licensing Board in publishing an article in their statewide newsletter highlighting the hazards of methylene chloride-based paint strippers and our recommendations for choosing safer approaches.
5. Assisted NIOSH and other FACE states on how to create digital stories based on their own fatality investigations.
6. Multiple tree care worker/employer evaluations of FACE materials revealed that individuals and companies plan to stage brush before feeding it into wood chippers, as per FACE recommendation.

End Outcomes

It is challenging to prove that findings, results, and recommendations have contributed to documented reductions in work-related fatalities in the workplace. Our program continues to work with a variety of governmental and non-governmental stakeholders to encourage safe work practices. Data and investigation findings from our program have been used to identify high hazard industries and occupations. We continue to work towards both legislative and non-legislative solutions to improve working conditions, increase worker and employer knowledge of workplace hazards, and to reduce the burden of work-related fatalities in California.

**CALIFORNIA OCCUPATIONAL HEALTH AND SAFETY SURVEILLANCE
WORK-RELATED ASTHMA PREVENTION
ANNUAL REPORT**

July 1, 2011 - June 30, 2012

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The overall aims of the project are to identify, characterize and prevent work-related asthma (WRA) in California by:

- expanding case ascertainment using multiple data sources
- performing case-based field investigations and developing prevention strategies
- collaborating with local and state agencies
- disseminating results generated from project activities; and
- evaluating surveillance activities on an ongoing basis

MAJOR OUTPUTS

Data

1. We identified and confirmed 4,957 work-related asthma (WRA) cases using the NIOSH guidelines from January 1, 1993 through March 1, 2012. Of these, 2,402 confirmed cases (48%) lacked temporal information necessary for case classification. Of the 2,555 cases that were classified, 55% were new onset and 45% were work-aggravated. Among the 1,400 new onset cases, 71% were classified as new onset, unknown inducer, 16% were new onset, known inducer, and 13% were new onset RADS cases.
2. The overall rate of WRA was 2.0 cases/100,000 workers. The 5 industries with the highest rates were transit and ground passenger transportation (16.0 /100,000); hospitals (12.1); museums, historic sites, and parks (8.1); utilities (7.3); and social assistance (6.6). The 5 occupations with the highest rates were firefighters (22.9/100,000); miscellaneous science technicians (15.0); medical assistants/healthcare support (11.4) telephone operators (11.4); and chemical technicians (10.2).
3. The most common exposures identified were dust, unknown chemicals, cleaning chemicals, smoke, mold, indoor air pollutants, paint, and indoor air pollutants from building renovation. The most commonly reported known asthma-inducing exposures (AOEC, 2012) were latex, bleach, formaldehyde, chlorine, glutaraldehyde, ammonia, diisocyanates, sulfuric acid, rat antigens, epoxies, and redwood.
4. Over 1,000 potential cases were identified from the DFR, WCIS, ED, and PDD data sets for 2010 and are now being interviewed.

Press, workshops, conferences, and new partnerships

1. We assisted the Interstate Chemical Threats Workgroup (ICTW) and the Agency for Toxic Substance Disease Registry (ATSDR) in the development of a national webinar

- about reducing cleaning product exposures in schools.
2. We developed an announcement on third party certification of asthma-safer cleaning products and distributed it to over 4,300 recipients through our electronic monthly newsletter (e-OHW).
 3. We collaborated with a variety of national partners in an alliance to begin developing a “Green Cleaning, Sanitizing and Disinfection Toolkit for Early Care and Education,” and participated in the national Collaborative to Promote Integrated Pest Management in Child Care Facilities.
 4. We participated on the steering committee to develop and organize an agenda and recruit speakers on WRA for an Asthma Research Summit, scheduled for December, 2012.

Presentations and Publications

1. Seaman et al. “Work-related asthma in the retail trade industry — California, Massachusetts, Michigan, and New Jersey, 1993–2006” at the Council of State and Territorial Epidemiologists Conference, Omaha, NE, June 2012
2. Levy BS et al. *Occupational and Environmental Health: Recognizing and Preventing Disease and Injury, Sixth Edition*. Oxford University Press, New York, 2011.
3. “Work-Related Asthma due to Wood Dust – California 1993-Present” at the 2nd International Symposium on Wood Dust/American Industrial Hygiene Conference, Portland, OR, 2011.
4. “Safer Alternatives in the Workplace: Cleaning for Asthma Safe Schools” at the American Public Health Association annual meeting, Washington D.C., November 2011
5. “Effective Policies to Reduce Exposures to Cleaning Products in Schools,” national webinar, 55 attendees November 2011
6. Chen W, Miller R, Weinberg J, Waldman J, Flattery J, Shrem D, Kumagai K, “Quantitative Assessment of Inhalation Exposures Generated from Floor Mopping Practices using Full-scale Chamber – A pilot Study,” Proc. Of Indoor Air 2011 – The 12th Int. Conf of Indoor Air Quality and Climate, 2011

MAJOR OUTCOMES

Potential Outcomes

1. Extent of Work-related Asthma

We have completed a preliminary analysis of WRA data from the Behavioral Risk Factor Surveillance System Asthma Call Back Survey (ACBS) for 2006-2009. These data show that an estimated 974,000 adults in California report that their asthma has been caused or aggravated by their work. These estimates and others from the ACBS, combined with case-based data from our surveillance system, have been used to illustrate the extent and nature of WRA in California in both an updated draft “Burden of Asthma” report and a draft fact sheet for workers about WRA. Both documents are awaiting department approval but will be used to demonstrate the degree to which WRA is under-recognized and under-diagnosed, as well as to characterize the risks from exposures, industries and occupations that are represented in our data. These findings can be used by our program and others to target prevention efforts.

2. Scope and Probe Processing and Disinfection

Several cases of WRA in workers performing scope and probe disinfection and sterilization at facilities of a major HMO were identified through surveillance efforts. To follow-up, we visited five hospitals to conduct walkthroughs of sterilization/disinfection facilities and processes, including new technologies using hydrogen peroxide and low concentrations of OPA in a closed system. We hope to learn about improvements in processing technologies so that we can promote safer alternatives industry-wide.

Intermediate Outcomes

1. Safer Schools White Paper

The information presented as part of the ATSDR webinar on cleaning agent exposures and illnesses in schools (“Effective Policies to Reduce Exposures to Cleaning Products in Schools”) serves as the basis for a white paper that is currently in development. The webinar outlined available data on cleaning products in schools, described green cleaning, provided an overview of legislative efforts around the country, and described California’s failed legislation for green and asthma-safer cleaning in schools. The purpose of the white paper is to promote national discussion and eventually legislation mandating best practices to better control cleaning chemical exposures that have caused asthma and other health effects among teachers, students, and other school administrators.

2. School Asthma-Safe Cleaning Guidelines

Our Cleaning for Asthma Safe Schools (CLASS) program has trained and provided technical assistance to multiple school districts around the state. The CLASS program has drafted guidelines that walk a school district through the steps required to transition to safer cleaning products and practices. Pilot projects that formed the basis for the guidelines served to train key district management and facilities staff in four districts that are attended by over 84,000 students. These districts are now trained to adopt asthma-safer cleaning practices to protect staff and students.

3. Third party certification for safer cleaning products

Two independent organizations, EcoLogo and Green Seal, publish certification standards that define which attributes a product must have to receive approval. The EcoLogo and Green Seal standards were developed by a variety of stakeholders, including public health professionals, product manufacturers, advocacy groups, and end users. We participated in the development and revision of these cleaning product standards and successfully argued for the prohibition of ingredients known to cause allergic-type asthma. Institutional purchasers, as well as consumers, can now choose cleaning products that receive approval under these standards and know that the ingredients they have purchased are not known asthmagens.

4. Low literacy fact sheets on asthma and cleaning

We have adapted our widely used and referenced fact sheet on cleaning agents and the prevention of WRA to a lower literacy level in order to reach a broader audience, including workers. It is also being translated into Spanish and Chinese in order to

reach as many workers as possible. The fact sheet provides workers with facts about WRA, how to recognize if they have symptoms, and strategies for preventing WRA from exposure to cleaning agents.

5. Migrant Health News Source

Our fact sheet on WRA and cleaning exposures was reproduced in Migrant Health News, the newsletter for the Migrant Clinicians Network. This newsletter was disseminated to the network's membership as part of a focus on WRA.

End Outcomes

It is challenging to prove that findings, results, and recommendations have contributed to documented reductions in work-related morbidity and mortality related to asthma in the workplace. However, our CLASS program has significantly reduced exposures to hazardous ingredients in cleaning chemicals in seven school districts that have followed our guidelines and transitioned to asthma-safe cleaning methods and products. This has reduced exposure to hundreds of teachers, custodians and staff members and over 48,000 students working and studying in the affected schools. In addition, our program has continued to collaborate with non-governmental advocates, local health departments, private industry, and other government agencies to develop and implement interventions and strategies for prevention targeted at the jobs, industries and exposures identified as high risk by our ongoing surveillance data. Our data are also continually used by academia and other public health agencies to characterize the nature and extent of WRA and focus further prevention efforts in order to reduce WRA. We also continue to work toward policy changes, such as the addition of asthmagens criteria to third party certification programs, to decrease exposures, improve working conditions, and to reduce the burden of work-related asthma in California.

**CALIFORNIA OCCUPATIONAL HEALTH AND SAFETY SURVEILLANCE
PESTICIDE-RELATED ILLNESS
ANNUAL REPORT**

July 1, 2011 - June 30, 2012

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The overall aims of the project are to identify, characterize, and prevent and occupational pesticide illness in California by:

- Expanding case ascertainment using multiple data sources
- Performing case-based field investigations and developing prevention strategies
- Collaborating with local and state agencies
- Disseminating results generated from project activities; and
- Evaluating surveillance activities on an ongoing basis.

MAJOR OUTPUTS

Data

1. We identified 4,390 case reports of occupational pesticide illness from January 1, 1998 through April 1, 2012. Of these, we have coded and analyzed 95%. We classified a total of 2,106 cases as definite, probable, or possible.
2. The overall pesticide illness rate is 0.9/100,000 workers. The top 5 industries with the highest rates are farm production and services (20/100,000 workers); services to buildings and dwellings (14); elementary and secondary schools (13); chemical manufacturing (10); and junior colleges (7). The top 5 occupations with the highest rates are pest control operators (53/100,000); agricultural field workers (40); agricultural graders and sorters (26); chemical processing machine operators (17); and agricultural supervisors (17).
3. We expanded our collaboration with CDPR and are now sharing data to aid case ascertainment.

Press, workshops, conferences, and new partnerships

1. We assisted the Interstate Chemical Threats Workgroup (ICTW) and the Agency for Toxic Substance Disease Registry (ATSDR) in the development of a national webinar about pesticide exposures in schools.
2. We developed a web topic page dedicated to preventing worker illness from indoor pesticide exposure that houses our new fact sheets as well as case studies and links to resources. One of the products included on this webpage is an alert about safer termite treatment options based on a site investigation of pesticide illnesses in a bank building. We disseminated these materials to over 4,600 recipients through our electronic monthly newsletter (e-OHW) and to 14,000 members of the California Building Owners and Managers Association through its internal electronic newsletter.
3. We started a new collaboration with CDPH's Vector Borne Disease Section to send

an electronic Occupational Health Watch to 4,200 recipients on Preventing Ticks Among Outdoor Workers, that included recommendations on using pesticides sparingly and safely. We are also working with them to disseminate information about bed bugs and safe pesticide use.

4. We developed a fact sheet about safer bed bug treatment and provided technical support to a local environmental and public health agency regarding medical management of affected individuals and cleanup of misapplied pesticides used to treat for bed bugs.

Presentations and Publications

1. "From tracking to prevention: Pesticide illness investigation and subsequent public health campaign" at the Council of State and Territorial Epidemiologists Conference, Omaha, NE, June 2012.
2. Schwartz A, Mitchell Y, Moraga-McHaley S, Gergely R, Calvert GM. Acute pesticide illnesses associated with off-target pesticide drift from agricultural applications: 11 States, 1998–2006. *Environ Health Perspect* 2011; 119:1162-1169.
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MAJOR OUTCOMES

Potential Outcomes

1. Agricultural workers

Our work that contributed to the acute pesticide illnesses associated with off-target pesticide drift paper illustrated that both direct exposure to pesticides and pesticide drift can increase the risk of acute pesticide-related illnesses. These findings were used to make the point that agricultural workers must be protected from pesticide exposure, especially because they do not have much control over the factors that contribute to their exposure. This was also the first article to demonstrate that female workers, who were not pesticide handlers, were more likely to be exposed to pesticides from drift compared to their male counterparts. This finding was the basis for a subsequent publication about gender differences in acute pesticide-related illness and injuries among farmworkers. Both of these articles were used to emphasize the point that greater efforts, such as stronger protections from drift, improved compliance

with pesticide regulations, and integrated pest management, are needed to protect farmworkers from pesticide exposure.

2. Illnesses associated with bed bug treatment

Our collaboration with the California Department of Pesticide Regulation (CDPR) in terms of sharing surveillance data was the basis for our collaborating with them in the investigation of pesticide illnesses associated with inappropriate applications of agricultural pesticides to indoor, residential environments and organophosphate poisoning among family members (including 3 children). Our work with CDPR, the local County Agricultural Commissioner, local environmental and public health officials, and local medical providers resulted in the closure of the home and mandated cleanup of the residence as well as treatment for the affected individuals. We developed, and distributed, a fact-sheet about work-related illnesses associated with treatment for bed bugs and we are working with our colleagues in Environmental Health on a similar fact sheet geared towards homeowners.

Intermediate Outcomes

1. Pesticides in schools

The information presented as part of the ICTW webinar on pesticide exposures and illnesses in schools (“Effective Policies to Reduce Exposures to Pesticides in Schools”) serves as the basis for a white paper that is currently in development. The purpose of the white paper is to promote national discussion and eventually legislation mandating best practices to better control pesticide exposures that have caused illnesses among teachers, students, and other school administrators.

2. Indoor pesticide treatment

After developing and disseminating materials about indoor pesticide applications, we were contacted by a local green business partnership organization that is adapting our materials and disseminating them to stakeholders to reduce pesticide use indoors and encourage safer treatments to prevent and treat pest infestations.

3. Hazard communication

Based on the findings of several investigations into pesticide illnesses due to indoor pesticide use, we worked with the California Department of Pesticide Regulation (CDPR) and California Occupational Safety and Health Administration (Cal/OSHA) to clarify that the Hazard Communication Standard and Injury and Illness Prevention Program Standard requirements to educate workers about chemical hazards apply to bystander employees whose workplaces are treated with pesticides. These efforts ensure clarification about workers’ rights and will be used to promote adequate training and education of workers in order to reduce illnesses from pesticide exposure.

End Outcomes

It is challenging to prove that findings, results, and recommendations have contributed to documented reductions in work-related morbidity, mortality, and exposure related to pesticide use in the workplace. Our program continues to work with a variety of governmental and non-

governmental stakeholders to encourage the elimination of the most toxic pesticides and the substitution of less-toxic pesticides and other non-chemical pest-control treatments. Data from our program has been used to help paint the picture of pesticide-related illness in California and has been used, alongside analogous data from other states, to demonstrate the extent of pesticide-related illnesses in certain populations (e.g. farm workers) and associated with certain pesticide uses (e.g. for the treatment of bed bugs) and causative factors that should be changed in order to reduce illness. We continue to work towards both legislative, and non-legislative, fixes to improve working conditions, increase worker and employer knowledge of pesticide-related health effects, and to reduce the burden of pesticide-related illnesses in California.

**CALIFORNIA OCCUPATIONAL HEALTH AND SAFETY SURVEILLANCE
CARPAL TUNNEL SYNDROME
ANNUAL REPORT**

July 1, 2011 - June 30, 2012

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The overall aims of the Carpal Tunnel Syndrome (CTS) project are to identify, characterize, and prevent work-related CTS in California by:

- Reestablishing and enhancing our previous surveillance system for CTS;
- Utilizing surveillance data to perform selected case follow-up and workplace interventions with prevention recommendations for employers and employees;
- Collaborating with local and state agencies and a wide range of other partners to track CTS in the workplace and implement prevention strategies;
- Disseminating using a variety of means our surveillance data, findings of case investigations, and intervention results; and
- Evaluating the results of surveillance, field investigations, and information dissemination.

MAJOR OUTPUTS

Data

1. Continued our analysis of existing administrative data sources that can be used for efficient and timely targeting of occupations and industries for intervention and prevention activities.
2. In collaboration with the Bureau of Labor Statistics (BLS), enumerated work-related CTS from multiple data sources for 2007-2008. Used three datasets for ascertainment of CTS cases: Workers Compensation Information System, Office of Statewide Health and Planning Data (ambulatory surgeries, emergency department visits, and hospital discharges), and Doctors First Reports of Injury and Illness (DFRs).
3. Extracted cases from the WCIS and developed a final CTS case classification scheme based on codes for Nature of Injury, Cause of Injury, Part of Body, and Injury Description. There were a total of 29,615 distinct WCIS cases of probable or possible work-related CTS.
4. Extracted cases from OSHPD and identified potential work-related CTS cases based on ICD-9 and procedure codes and expected payer (workers compensation). Submitted social security numbers to a commercial service and obtained names for over 15,000 OSHPD CTS cases in California for the years 2007-2008. Cases were matched to the WCIS CTS extract to obtain employer and occupational information. For the two-year period 2007-2008, there were 15,605 CTS cases in the OSHPD database.
5. Selected approximately 6,300 DFRs from 2007 and 2008 that were likely to represent cases of CTS. Classified cases into four categories (Definite, Probably, Possible, and Uncertain CTS), and de-duplicated using an iterative process. After de-duplication, a total of 2,309 cases of DFRs were identified for 2007-2008.

6. There were 39,867 CTS cases identified from all data sources for 2007-2008. 11% of these cases were linked to multiple datasets. The largest proportion of the enumeration was accounted for by cases found in WCIS only (63%), followed by OSHPD (23%) and DFRs (2.8%). The total number of CTS cases from these data sources was significantly greater than the number estimated by the BLS Survey of Occupational Injuries and Illnesses.
7. For the years 2006-2011, identified the ten leading occupations with CTS cases. Reviewed this data for the ten leading occupations to determine whether (1) there is evidence in the medical or scientific literature of ergonomic interventions for these occupations that can reduce the risk of MSDs; (2) information is already widely available to employers and employees about how to reduce the risk of MSDs; and (3) targeted ergonomic interventions are feasible and have an opportunity for collaboration.
8. Selected cake decorators, nurses, legal assistants and dental hygienists for ergonomic evaluation and interventions
9. Identified California establishments with two or more claims of CTS among employees with the same job title within any 12-month period between 2006 and 2011. In order to prioritize employers for worksite evaluations, established a cutoff number of "repeater" claims for each occupational group of interest.
10. Selected one large retail club company with multiple establishments as the target of initial ergonomic intervention.

Partnerships

1. Collaborated extensively with the UC Berkeley Ergonomic Program (David Rempel, MD), California Division of Workers Compensation, BLS and two other states (Massachusetts and Washington) in developing our methods, analysis and interpretation of CTS surveillance data.

Presentations

1. Joe, L et al: "Enumeration of work-related amputation and carpal tunnel syndrome using multiple data sources." CSTE Annual Conference, June 2011.
2. Beckman, S. et al: "Enumeration of work-related amputation and carpal tunnel syndrome using multiple data sources – results and discussion." CSTE Annual Conference, June 2011.
3. Joe, L et al: Undercounting of Work-related Amputations and Carpal Tunnel Syndrome in California: Evaluation of Multiple Data Sources, NIOSH NOIRS meeting, October 2011.
4. Joe, L et al: Using an Administrative Workers' Compensation Claims Database for Occupational Health Surveillance in California: Validation of a Case Classification Scheme for Carpal Tunnel Syndrome. CSTE Annual Conference, June 2012.

MAJOR OUTCOMES

Potential Outcomes

1. Completed a major report of CTS surveillance findings in California, and presented summary of results to BLS, NIOSH and State research partners in July 2012.
2. Demonstrated feasibility and utility of using a multisource surveillance system to enumerate cases of CTS in California

3. Identified employers with multiple cases of CTS that may benefit from public health education and intervention efforts to implement an effective ergonomic program

Intermediate Outcomes

1. Developed recommendations to BLS and NIOSH for an ongoing multisource system to track cases of CTS in California
2. Presented data to the California Division of Occupational Safety and Health (CalOSHA) suggesting the feasibility of using workers compensation data to identify industries and occupations at high risk of CTS

End Outcomes

It is often quite difficult to attribute a change in morbidity or mortality to specific work conducted by OHB, especially when multiple entities are carrying out various interventions aimed at the same occupational health problem. However, when multiple parties come together at one point in time to respond jointly to a newly identified issue with a comprehensive, concerted effort, it can be easier to see the overall impact.

An ongoing multisource surveillance system for CTS in California has the potential to identify high-risk occupations and industries that can implement effective ergonomic programs to reduce the known risk factors for work-related musculoskeletal disorders (MSDs). In 2011, California enacted a standard for Safe Patient Handling in acute care hospitals that may significantly lower the rate of MSDs. The methods for CTS surveillance can be applied to tracking the incidence of other MSDs such as back injuries that occur to healthcare personnel in these settings. Likewise, in 2012 the California Safety and Health Standards Board will consider a new standard to reduce MSDs among hotel housekeepers. The surveillance methods and systems for tracking CTS cases are currently being used to evaluate the risk of MSDs among this population, and to inform the rulemaking process. The ongoing analysis of surveillance data on the risk of CTS and other MSDs in selected occupations and industries can lead to public health and regulatory interventions that reduce the medical and other costs associated with these disorders.